

Name: \_\_\_\_\_  
A2CC1: Review Sheet for Quarter 1 Quarter Exam

Date: \_\_\_\_\_

**COMPLETE ALL PROBLEMS ON A SEPARATE SHEET OF PAPER!**

**This is a sampling of the types of questions that we have covered. Be sure to go over your notes, homework assignments, and old tests to fully prepare.  
Quarter Exam is on Wednesday November 8<sup>th</sup>.**

1) Factor each of the following completely:

a)  $5x^2 - 25x$

b)  $3a^4b^2m - 75a^3bm$

c)  $3x^2 - 48$

d)  $x^2 + 3x - 18$

e)  $5x^2 - 32x - 21$

f)  $4x^2 + 20x + 9$

g)  $15x^3 - 25x^2 + 75x - 125$

h)  $6x + 21$

i)  $16x^8y^4 - 81z^4$

j)  $2x^2 + 20x + 48$

2) Subtract  $(-3 + 2i)$  from  $(3 + 5i)$

3) Write as a power of  $i$  in simplest terms:  $5i^{201}$

4) Solve for  $x$ :  $\left(\frac{1}{2}\right)^{1-x} = 4$

5) Rewrite  $3x^{\frac{-2}{3}}$  using radicals

6) Write each of the following in simplest radical form:

a)  $\sqrt{90} + \sqrt{250}$

b)  $\sqrt{98} - 3\sqrt{18}$

c)  $\frac{5\sqrt{20}}{10\sqrt{10}}$

d)  $\sqrt{2}(3\sqrt{18} - \sqrt{8})$

7) Simplify the following and write with positive exponents:

a)  $(12x^3y^2)^2 \left( \frac{x^3y}{4} \right)$

b)  $(xy)^2 (2x)^{-1}$

c)  $\frac{a^{-2}b^4}{a^{-7}b^{-1}c}$

8) Solve each of the following for x:

a)  $(x+2)^{\frac{3}{2}} = 64$

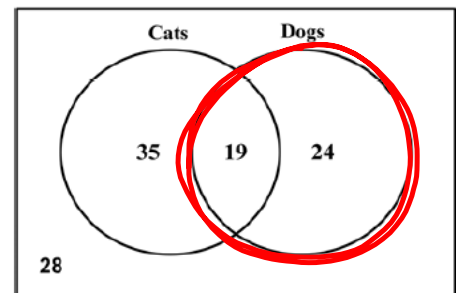
b)  $2x^{\frac{2}{5}} = 32$

c)  $2x^{\frac{1}{3}} - 2 = 3$

d)  $16^{x-1} = 8^x$

e)  $3^{x+82} = 1$

32. If a restaurant is chosen at random in Rhinebeck then there is an 84% chance that it is open on Sunday and a 42% chance that it is open on Monday. If there is a 96% chance it is open on either Sunday or Monday, what is the probability that it is open both days?
- (1) 30%      (2) 44%      (3) 38%      (4) 50%
33. The probability on any given work day that Kirk gets less than five hours of sleep the night before and doesn't shave is 0.65. If there is a 0.20 probability on any given day that he shaves and a 0.70 probability he gets less than five hours of sleep, then what is the probability he doesn't shave given that he got less than five hours of sleep?
- (1) 0.73      (2) 0.81      (3) 0.78      (4) 0.93
34. A survey of 106 households was done to investigate the type of pets in the house. The results are shown in the Venn diagram below. If a household was selected at random, which of the following would be the probability the house would have cats given they have dogs?
- (1) 0.33      (2) 0.44      (3) 0.56      (4) 0.63



$$P(\text{Cats given dogs}) = \frac{\text{Both}}{\text{Dogs}}$$

$$= \frac{19}{19+24} = \frac{19}{43} \approx .44$$

$$32) P(OR) = P(A) + P(B) - P(Both)$$

$$.96 = .84 + .42 - \underline{P(Both)}$$

$$\begin{array}{r} .96 = 1.26 - P(Both) \\ -1.26 \quad -1.26 \\ \hline \end{array}$$

$$\begin{array}{r} -.30 = -P(Both) \\ \hline -1 \quad -1 \end{array}$$

$$.30 = P(Both)$$

$$(30\%)$$

$$33) P(A \text{ given } B) = \frac{P(Both)}{P(B)}$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$P(\text{No Show given less than 5 hrs}) = \frac{P(Both)}{P(\text{less than 5 hrs})} = \frac{.65}{.70} \approx \boxed{.93}$$

$$1) \ a) \ 5x^2 - 25x$$

$$\boxed{5x(x-5)}$$

$$b) \ 3a^4b^2m - 75a^3bm$$

$$\boxed{3a^3bm(ab-25)}$$

$$c) \ 3x^2 - 48$$

$$3(x^2 - 16)$$

$$\boxed{3(x+4)(x-4)}$$

$$d) \ x^2 + 3x - 18$$

$$\boxed{(x+6)(x-3)}$$

$$e) \ 5x^2 - 32x - 21$$

$$ac = -105, \ b = -32$$

$$\begin{array}{r} 5x^2 - 35x + 3x - 21 \\ \underline{5x(x-7)} \quad +3(x-7) \end{array}$$

$$\boxed{(x-7)(5x+3)}$$

$$f) \ 4x^2 + 20x + 9$$

$$ac = 36, \ b = 20$$

$$\begin{array}{r} 4x^2 + 18x + 2x + 9 \\ \underline{4x^2 + 18x} \quad +1(2x+9) \end{array}$$

$$\boxed{(2x+9)(2x+1)}$$

$$g) \ 15x^3 - 25x^2 + 75x - 125$$

$$5(3x^3 - 5x^2 + 15x - 25)$$

$$5(x^2(3x-5) + 5(3x-5))$$

$$\boxed{5(3x-5)(x^2+5)}$$

$$h) \ 6x + 21$$

$$\boxed{3(2x+7)}$$

$$i) \ 16x^8y^4 - 81z^4$$

$$(4x^4y^2 + 9z^2)(4x^4y^2 - 9z^2)$$

$$\boxed{(4x^4y^2 + 9z^2)(2x^2y + 3z)(2x^2y - 3z)}$$

$$j) \ 2x^2 + 20x + 48$$

$$2(x^2 + 10x + 24)$$

$$\boxed{2(x+4)(x+6)}$$

$$2) (3+5i) - (-3+2i)$$

$$3+5i + 3 - 2i$$

$$\boxed{6+3i}$$

$$3) 5i^{201}$$

$$4 \overline{) 201} \begin{array}{r} 50 \\ \underline{200} \\ 1 \end{array}$$

.25 means  $i^1$

$$\boxed{5i}$$

$$4) \left(\frac{1}{2}\right)^{1-x} = 4$$

$$(2^{-1})^{1-x} = 2^2$$

$$2^{-1+x} = 2^2$$

$$\begin{array}{r} -1+x = 2 \\ +1 \quad +1 \\ \hline \boxed{x=3} \end{array}$$

7) a)  $(12x^3y^2)^2 \left(\frac{xy^3}{4}\right)$

$$(12x^3y^2)(12x^3y^2)\left(\frac{xy^3}{4}\right) = \frac{\overset{36}{\cancel{144}}x^9y^5}{\cancel{4}} = 36x^9y^5$$

b)  $(xy)^2 \cdot (2x)^{-1}$

$$\Rightarrow \frac{(xy)^2}{(2x)^1} \Rightarrow \frac{\cancel{x}^2 y^2}{\cancel{2} x} = \boxed{\frac{xy^2}{2}}$$

c)  $\frac{a^{-2}b^4}{a^{-7}b^{-1}c} = \boxed{\frac{a^5b^5}{c}}$

8) d)  $16^{x-1} = 8^x$

$$2^4 = 16 \quad 2^3 = 8$$

$$\left(2^4\right)^{x-1} = \left(2^3\right)^x$$

$$2^{4x-4} = 2^{3x}$$

$$\begin{array}{r} 4x - 4 = 3x \\ -4x \quad -4x \\ \hline -4 = -1x \\ -1 \quad -1 \\ \hline 4 = x \end{array}$$

a)  $(x+2)^{\frac{3}{2}} = 64^{\frac{2}{3}}$

$$(x+2) = 16$$

$$\begin{array}{r} -2 \quad -2 \\ \hline x = 14 \end{array}$$

c)  $2x^{\frac{1}{3}} - 2 = 3$

$$\begin{array}{r} +2 \quad +2 \\ \hline 2x^{\frac{1}{3}} = 5 \\ \frac{2x^{\frac{1}{3}}}{2} = \frac{5}{2} \\ x^{\frac{1}{3}} = \left(\frac{5}{2}\right)^{\frac{3}{1}} \\ x = \frac{5^3}{2^3} = \frac{125}{8} \end{array}$$

e)  $3^{x+82} = 1$

⊗ Any non zero Number raised to 0 gives us 1

$$3^{x+82} = 3^0$$

$$\begin{array}{r} x+82 = 0 \\ -82 \quad -82 \\ \hline x = -82 \end{array}$$

b)  $2x^{\frac{2}{5}} = 32$

$$\frac{2x^{\frac{2}{5}}}{2} = \frac{32}{2}$$

$$x^{\frac{2}{5}} = 16$$

$$x = \pm 1024$$



5)

$$3x^{-\frac{2}{3}} \Rightarrow \frac{3}{x^{\frac{2}{3}}} \Rightarrow \frac{3}{\sqrt[3]{x^2}}$$

c)  $\frac{\cancel{5}\sqrt{\cancel{20}}_2}{\cancel{10}\sqrt{\cancel{10}}_1} \Rightarrow \frac{1\sqrt{2}}{2\sqrt{1}} = \frac{\sqrt{2}}{2}$

d)  $\sqrt{2}(3\sqrt{18} - \sqrt{8})$

$$3\sqrt{36} - \sqrt{16}$$

$$\downarrow \quad \downarrow$$

$$3 \cdot 6 - 4$$

$$18 - 4 = 14$$

b)  $\sqrt{98} - 3\sqrt{18}$

$$\begin{array}{cc} \swarrow & \searrow & \swarrow & \searrow \\ \sqrt{49} & \sqrt{2} & \sqrt{9} & \sqrt{2} \\ 7\sqrt{2} & - & 3 \cdot 3\sqrt{2} \\ 7\sqrt{2} & - & 9\sqrt{2} \\ -2\sqrt{2} \end{array}$$

a)  $\sqrt{90} + \sqrt{250}$

$$\begin{array}{cc} \swarrow & \searrow & \swarrow & \searrow \\ \sqrt{9} & \sqrt{10} & \sqrt{25} & \sqrt{10} \\ 3\sqrt{10} & + & 5\sqrt{10} \\ 8\sqrt{10} \end{array}$$

